

CLAIMS

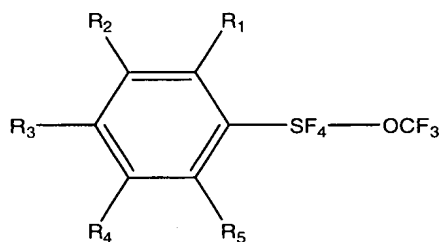
1. A composition comprising RSF_4OCF_3 , wherein R is an organic group and SF_4OCF_3 is bonded to a carbon of the organic group.

2. The composition of claim 1, wherein R comprises a ring of six carbon atoms.

3. The composition of claim 1, wherein R is substituted or unsubstituted cyclohexyl.

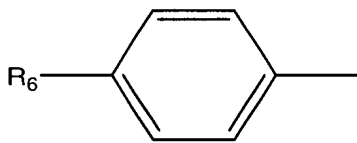
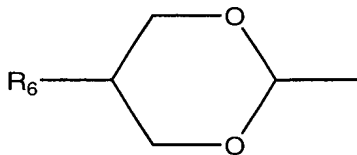
4. The composition of claim 1, wherein R is substituted or unsubstituted phenyl or naphthyl.

5. A composition comprising a structure of the following formula:

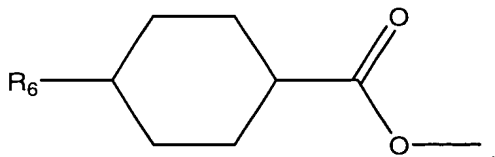


wherein R_1 , R_2 , R_3 , R_4 , and R_5 are members independently selected from the group consisting of H, alkyl, aryl, cycloalkyl, halogen, nitro, perfluoroalkyl, cyano, methoxy, trifluoromethoxy, sulfur pentafluoride and (trifluoromethoxy)tetrafluorosulfuranyl.

6. The composition of claim 5, wherein each of R_1 , R_2 , R_4 , and R_5 is H and R_3 is represented by one of the following formulas:



or



wherein R_6 is a alkyl, cycloalkyl or substituted phenyl.

7. The composition of claim 5, wherein the composition is a liquid crystal and a (trifluoromethoxy)tetrafluorosulfuranyl group of the structure is a head group of the liquid crystal having a dielectric anisotropy of at least 11 and an optical birefringence of at least 0.1.

5 8. The composition of claim 5, wherein the SF_4OCF_3 is present in the composition solely in a fac form.

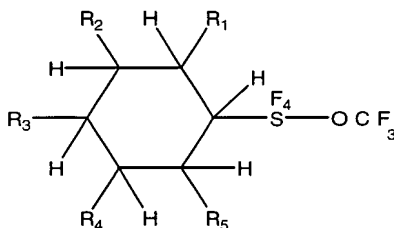
9. The composition of claim 5, wherein the SF_4OCF_3 is present in the composition solely in a mer form.

10. The composition of claim 5, wherein at least one of R_1 and R_5 is F.

10 11. An aryl trifluoromethoxytetrafluorosulfarane.

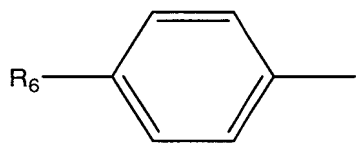
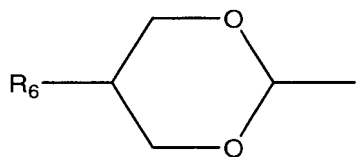
12. A composition comprising a structure of the following formula:

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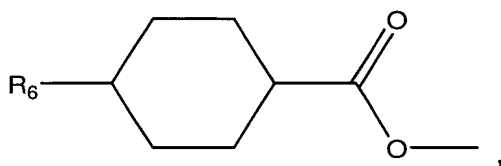
wherein R_1 , R_2 , R_3 , R_4 , and R_5 are members independently selected from the group consisting of H, alkyl, aryl, cycloalkyl, halogen, nitro, perfluoroalkyl, cyano, methoxy, trifluoromethoxy, sulfur pentafluoride and (trifluoromethoxy)tetrafluorosulfuranyl.

20 13. The composition of claim 12, wherein each of R_1 , R_2 , R_4 , and R_5 is H and R_3 is represented by one of the following formulas:



OR

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wherein R₆ is a alkyl, cycloalkyl or substituted phenyl.

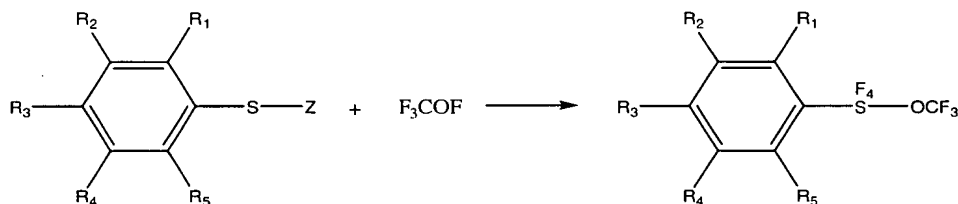
14. The composition of claim 12, wherein the composition is a liquid crystal and a (trifluoromethoxy)tetrafluorosulfanyl group of the structure is a head group of the liquid crystal having a dielectric anisotropy of at least 11 and an optical birefringence of at least 0.1.

15. The composition of claim 12, wherein the SF₄OCF₃ is present in the composition solely in a fac form.

16. The composition of claim 12, wherein the SF₄OCF₃ is present in the composition solely in a mer form.

17. The composition of claim 12, wherein at least one of R₁ and R₅ is F.

18. A process for preparing the composition of claim 1, said process being represented by the following equation:



where S-Z is S-H, disulfide, S-Cl or SF₃.

19. A process for preparing the composition of claim 1, said process comprising reacting an aryl sulfurchlorotetrafluoride or an aryl sulfurbromotetrafluoride with a source of -OCF₃, such that the -OCF₃ displaces a chlorine atom from the aryl sulfurchlorotetrafluoride or a bromine atom from the aryl sulfurbromotetrafluoride by direct combination, photo-catalytic reaction, or thermally induced displacement, to provide the composition.

20. A process for preparing the composition of claim 1, said process comprising reacting an arylsulfur trifluoride with an active fluoride base and an oxidative source of -OCF₃ to provide the composition.